

# Spontaneous Recovery of Ruptured Fetal Membranes Before The 20<sup>th</sup> Gestational Week Resulting in Term Pregnancies

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**OBJECTIVE:** To report six cases in which preterm premature rupture of fetal membranes (PPROM) developed before the 20th gestational week and spontaneously recovered ending-up with full term pregnancies.

**STUDY DESIGN:** This study reports six pregnant women who were admitted to our clinic between 1998 and 2003 due to PPRM diagnosis before the 20th gestational week and in whom amniotic fluid flow spontaneously stopped and full-term pregnancies were achieved. Socio-demographic and clinical characteristics of all cases were retrospectively examined.

**RESULTS:** Mean gestational age of the cases was 14.6±2.2 weeks and amniotic fluid leakage stopped within 3.7±1.6 days. Recurrent PPRM was observed in two of those pregnancies at the 26th and 28th gestational weeks. Term pregnancies were achieved in all cases.

**CONCLUSION:** Although prognosis is extremely unfavorable in cases with very early PPRM development, there is the possibility, though weak, of spontaneous recovery and full-term pregnancy. However, the selection of these cases is of utmost importance. Further studies should be conducted for cost-effective determination of case selection criteria.

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**Key Words:** Preterm premature rupture of membranes, Term pregnancy, Spontaneous recovery

Preterm premature rupture of membranes (PPROM) is an important obstetric problem that is observed in about 3-4% of all pregnancies and held responsible for approximately 40% of preterm births.<sup>1,3</sup> Its etiology has not been clarified yet. There are only a few experimental studies where invasive techniques such as intraamniotic platelet, cryoprecipitate, amniopatch and collagen graft placement were tried for its treatment.<sup>4,5</sup> Therefore attention has been focused on the principles to be used when approaching such patients and the attempts to extend the latent phase. Conservative management may extend the duration of pregnancy but puts the fetus and the mother under the risk of infection.<sup>6</sup> One factor as important as the maternal and fetal condition in cases with PPRM is the gestation age.<sup>7</sup> As the gestational age decreases, fetal-neonatal prognosis severely deteriorates. A study evaluating second trimester PPRM at weeks 14-19, 20-25 and 26-28 showed that the time lapse until birth were 72, 12 and 10 days respectively, and the perinatal survival rates were 40%, 92% and 100%, respectively.<sup>6</sup> PPRM develops before the 26th gestational week in 0.65% of the cases and its prognosis is extremely unfavorable.<sup>8</sup> However, spontaneous recovery and live births were also reported in some cases. The present study reports six cases in which

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full-term pregnancies were achieved following spontaneous recovery of ruptured fetal membranes which occurred before the 20th gestational week.

## Material and Methods

The present study retrospectively analyzed the cases admitted to Obstetrics and Gynecology Clinic of Firat University Medical Center between 1998 and 2003 due to PPRM at the 14-20<sup>th</sup> gestational weeks and which ended up with full term pregnancies after spontaneous recovery of the ruptured membranes.

The diagnosis of PPRM was made upon observation of active amniotic fluid leakage from cervical ostium at speculum examination, identification of amniotic fluid accumulation in the posterior fornix and detection of alkali pH in the nitrazine test and typical crystallization in the fern test conducted on samples taken from the fluids.

After diagnosis, urine and cervical-vaginal cultures were collected and all cases were sent to bed rest. They were asked not to stand up, unless necessary. Intravenous hydration and prophylactic antibiotic treatment (ampicillin 1 gr, 4 times a day) were started and sustained for 7 days. A liquid diet was recommended during this period. Daily leukocyte count, C-reactive protein (CRP) levels and fundal sensitivity, malodorous vaginal leak and amnion fluid levels at ultrasonography were closely monitored. Lack of active or passive amniotic fluid discharge, negative fern and nitrazine tests and absence of anhydramnios in the ultrasonographic examination were accepted as recovery of the premature membrane rupture.

Maternal age, number of pregnancies, number of births, gestational week (according to ultrasonography and menstrual date), the period that lapsed from membrane rupture to

birth (latent period), educational and economic status of all cases were established.

Descriptive statistics was used as the statistical method and all values were expressed as % (n) and/or mean±SD.

## Results

Socio-demographic characteristics of all cases who were hospitalized in our clinic between 1998 and 2003 with the diagnosis of PPRM before the 20<sup>th</sup> gestational week are presented in Table 1.

*Table 1. Parameters of cases in which ruptured membranes spontaneously recovered and full-term pregnancy was achieved*

	n:6
Age (year)	29.4±3.6
Gravida (number)	2.2±0.7
Parity (number)	1.2±0.7
Gestational age (week)	14.6±2.2
Educational level	
Primary school	%33.3 (n:2)
Secondary school	%33.3 (n:2)
High school	%33.2 (n:2)
Income level	
Average	%66.6 (n:4)
High	%33.3 (n:2)
BMI (kg/m <sup>2</sup> )	25.1±1.1
Positive vaginal-cervical culture	%16.6 (n:1)
Positive urine culture	%16.6(n:1)
Discontinuation of amniotic fluid leakage (day)	3.7±1.6

All pregnancies, but one, were natural. One pregnancy was achieved by in vitro fertilization embryo transfer (IVF-ET) and the mother was 38 years old. One case was primigravida, others were multigravida; none had a previous abortion.

Examination for infections revealed positive cultures in two cases. One of these had *E. coli* in urine culture and the other had *Candida* in cervical-vaginal culture (Table 1). *E. coli* was sensitive to ampicillin and the treatment was continued. The women who had vaginal candidiasis was asymptomatic and was not treated.

Amniotic fluid leakage from the cervix stopped on the 2nd day at the earliest and on the 6<sup>th</sup> day at the latest. It stopped within the first three days in 4 cases (66%) and continued till the 6th day in two cases. Fifty % (2 out of 4) of the cases recovering spontaneously within the first three days were under the 15<sup>th</sup> gestational week. Except for two cases, none developed recurrent membrane rupture till full term after the cervical amniotic fluid leakage stopped. One of these two was the case hospitalized in the clinic due to PPRM when 15 weeks and 4 days pregnant and whose am-

niotic fluid discharge recovered. She was re-hospitalized upon recurrent PPRM at the gestational week of 26; this time the fluid leak recovered on the 5<sup>th</sup> day and did not recur. The other case had 14 weeks 2 days gestation, re-hospitalized upon recurrent PPRM at week 28 and full-term pregnancy was achieved after amniotic fluid discharge stopped.

At term, 3 women gave birth by cesarean due to obstetric indications and others through vaginal route. The birthweight of the babies ranged between 2400 and 3200 (mean:2850 grams). None of the neonates developed any problem requiring intervention during the period they spent in the hospital.

## Discussion

The present study reported cases in which PPRM developed before the 20th gestational week and whose fetal membranes spontaneously recovered, resulting in full-term pregnancy. In this respect our study is the one with the highest number of cases in the literature. Of the studies which were in the form of case reports, the one with the highest number of cases was conducted by Schierlitz et al. and included 3 cases.<sup>9</sup> In the concerned study, among the pregnant women in whom PPRM developed before the 20th gestational week and whose membrane ruptures spontaneously recovered, only one gave term and the other two had preterm birth. Our study presents cases achieving full-term pregnancy. The literature does not provide a rate for the incidence of spontaneously recovering PPRM. The cases we report are those diagnosed in our clinic within the last 5 years. Since the cases having the same characteristics but resulting in spontaneous or induced miscarriage have not been documented yet, we cannot present a rate herein.

As it is known, prognosis is extremely poor in PPRM that develops in early stages of pregnancy. When membrane rupture develops before the 20<sup>th</sup> gestational week, the family should be informed about quite high perinatal mortality and morbidity.<sup>10</sup> About 75% of the conservatively managed cases with premature membrane rupture frequently give birth within one week.<sup>11</sup> In our study all the cases were informed that the pregnancy could result in miscarriage or may end up with several perinatal consequences, if it did not. Besides, termination of pregnancy was offered as an alternative to follow-up. Those who wanted to continue with their pregnancy were subjected to the routine follow-up protocol applied in PPRM cases. Our routine approach protocol in PPRM cases include culture analyses, follow-up of daily leukocyte counts and CRP levels, as well as hourly measurements of maternal temperature, daily evaluation of fundal sensitivity and the color and odor of the vaginal fluid that can suggest infection, intravenous hydration and administration of antibiotics (usually ampicillin 4 gr/day). The pregnancy is immediately terminated when chorioamnionitis is clinically suspected and antibiotic treatment is re-adjusted according to culture results. Pelvic examination is not per-

formed in these cases unless necessary, and only speculum examination is performed. Transvaginal USG is conducted under sterile conditions to evaluate the cervix, when it is absolutely necessary to do so.

When our cases were retrospectively analyzed, with respect to the risk factors reported for PPRM such as smoking, membrane rupture or miscarriage history in the previous pregnancy, low socio-economic status, multiple pregnancies, polyhydramnios and urogenital infection, it was found out that only two cases had urogenital infection.<sup>12,13</sup> The major factor supposed to be responsible from PPRM is chorio-desidual infection and inflammation in premature pregnancies, and decrease in the membrane collagen content and apoptosis in later weeks.<sup>7,14,15</sup> Despite all this literature information, reparation mechanism of the membrane has not been revealed yet. However, it is suggested that elimination of the etiological problems may ensure the spontaneous correction of the present defect. The investigation of the reparation mechanism for the defects that appear after invasive procedures such as amniosynthesis, chorionic villus sampling or fetoscopy may guide in the treatment of cases with spontaneous membrane rupture.<sup>4</sup> None, but one, of our cases was found to have a clinical infection sign. Subclinical infections were monitored by CRP levels and were within normal range in all of our cases. But, they all received a full course of antibiotic treatment, as mentioned.

In conclusion, although prognosis in PPRM cases is extremely poor in very premature pregnancies, being aware of the rare spontaneous recovery as reported in our study, conservative approach may be possible in some cases. Further studies, perhaps multicentric, should be carried out to determine cost-effective case selection criteria for conservative management. The cases presented herein were the ones conservatively managed and thought to have spontaneous recovery of ruptured membranes due to the discontinuation of amniotic fluid discharge. The most reliable method in diagnosis of PPRM is intra-amniotic dye injection. This is not a routine diagnostic test used in our clinic. Instead the diagnosis of rupture and recovery of membranes are based solely on clinical observation and examinations conducted by conventional methods as mentioned in our study. It is reported that spontaneous recovery is a rare but desired condition in cases who present with such complaints.

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